Biodiversity
RECOVERY PLAN

Final Draft for Public Review
September 1999

CHICAGO WILDERNESS

A Regional Nature Reserve

Preface

This plan is the result of efforts by more than 200 people who participated in preparing background papers and in workshops to address scientific and policy issues. These have included taxonomic workshops that focused on groups of species (mammals, birds, amphibians, etc.) and ecosystem types (forests, prairies, wetlands, etc.) The plan has also been shaped by the work of the various Chicago Wilderness Teams (Science, Land Management, Education and Communications, and Policy and Strategy), as well as a wide variety of other workshops including the recovery plan review session during the 1999 Chicago Wilderness Congress.

While no portion of the plan is the product of any one person, members of the Recovery Plan Task Force served as editor / writers for one or more chapters or major chapter segments. Laurel Ross, of The Nature Conservancy, John Paige and Irene Hogstrom Martinez of the Northeastern Illinois Planning Commission (NIPC), Kent Fuller of the U.S. Environmental Protection Agency, Tim Sullivan and Elizabeth McCance of the Brookfield Zoo, Ders Anderson of the Openlands Project, Susanne Masi of the Chicago Botanic Garden and Jim Anderson of the Lake County Forest Preserve District and the Chicago Wilderness Science Team all served in this capacity. Steve Packard of the National Audubon Society provided valuable comments throughout and John Oldenberg of the DuPage County Forest Preserve District provided essential input on the perspective of Forest Preserve Districts. Larry Christmas of NIPC created the first integrated draft of the plan. Barbara Hill served as technical editor. Special recognition is due to Elizabeth McCance and Tim Sullivan for their tireless work in organizing the many science workshops and the resulting work products. Also, recognition is due to Wayne Schennum of the McHenry Conservation District for his valuable contributions to virtually all of the science workshops together with his integrative perspective.

Initial funding for development of the recovery plan was provided through grants from the U.S. Environmental Protection Agency. Additional funding was provided by the Illinois Department of Natural Resources, the U.S. Forest Service, and the U.S. Fish and Wildlife Service. Matching funds were provided by the Illinois Chapter of the Nature Conservancy, NIPC, and the Brookfield Zoo.

A major strength of this plan lies in its creation through a participatory process that assembled a broad based consensus of expert opinion. If it is to remain valid and become implemented, it must continue to be refined, to grow, and to incorporate new information as it becomes available. **This is the intent as it is offered for wide public comment. Comments are welcome at any time and can be sent to Chicago Wilderness in care of John Paige at the Northeastern Illinois Planning Commission, 222 S. Riverside Plaza, Suite 1800, Chicago, IL 60606.**

Table of Contents

Appendices

Tables and Figures

Chapter 1

Executive Summary

Chicago Wilderness and Its Biodiversity Recovery Plan

1.1 Introduction

1.1.1 Chicago Wilderness: who we are, what we are accomplishing.

"Chicago Wilderness" refers to nature and to the people and institutions that protect it. Chicago Wilderness is 200,000 acres of protected conservation land—some of the largest and best surviving woodlands, wetlands, and prairies in the Midwest. It is also the much larger matrix of public and private lands of many kinds that support nature in the region along with the people who protect and live compatibly with it.

Native Americans were part of the natural ecosystem here for thousands of years. Today, thousands of volunteers and hundreds of scientists, land managers, educators, and others are crucial to the survival of our natural ecosystems, as is the "Chicago Wilderness" work of the 88 member organizations. The geographic area covered by the Chicago Wilderness region includes northeastern Illinois, northwestern Indiana, and southeastern Wisconsin. The coalition's membership includes local governments, state and federal agencies, centers for research and education, and conservation organizations.

The boundaries of the Chicago Wilderness region capture a spectacular concentration of rare ecosystem types. These ecosystems harbor a high diversity of species, including a large number of those listed as threatened or endangered in the states of Illinois, Indiana, and Wisconsin. Indeed, outside of the Chicago Wilderness region, levels of diversity drop off sharply. Boundaries of the watersheds containing the natural communities helped to define the region, as did the large concentration of natural preserves in the metropolitan area.

Many of the surviving natural communities of the Chicago region are of national and global significance for conservation. The region is blessed with both richness and opportunity for its conservation. Yet research indicates that we are experiencing a steady decline in both native species and communities. For example:

- In a review for this plan, the Chicago Wilderness Science and Land Management Teams found that more than half of the major community types of the region were at the highest level of conservation concern due either to the small amount remaining or to the poor ecological health of the remaining examples.
- A 1995 survey of DuPage County forest preserves revealed that 80% of its natural areas had declined to poor health (Applied Ecological Services 1995).
- A region-wide 1998 study by the Morton Arboretum (Bowles et al. 1998b) documented a significant change over the past 20 years in forest structure, including a decline in density and richness of shrub species, a loss of mid-size oaks, and an increase in smaller-size sugar maples. The study attributed these changes to increased shade owing to greater oak and maple canopy cover and, in some cases, to deer browsing.

While the community types in the region have in some cases almost vanished from the earth, this challenge is far different from other societal challenges we face in that we know what needs to be done to address it. The Chicago region's farsighted leaders set up preserve systems that today support almost all of the species ever known to have occurred in the region's vast prairies, savannas, woodlands, dunes, marshes, fens, and sedge meadows. Restoration ecology, a growing field for applied research, has provided proven techniques and tools to manage these fragmented natural areas. The Chicago region is a center of expertise and citizen involvement in the restoration and management of these rare natural communities.

The purpose of the Chicago Wilderness collaboration is to sustain, restore, and expand our remnant natural communities. Thanks to a great concentration of professional expertise and the contributions of thousands of volunteers, we have the ability to achieve this purpose, and in a cost-effective manner. In doing this, we are also enriching the quality of life for ourselves and our children. Now in its third year, our collaborative effort is starting to take larger strides to build something big, something that could some day transform this region into the world's first urban bioreserve, a metropolitan area where people live in harmony with rare and valuable nature.

1.1.2 What is meant by biodiversity and why is it important?

The terms *ecosystems*, *natural communities*, *biodiversity*, and *sustainability* are used throughout this plan. An ecosystem is the combination of living things and the physical systems (geology, topography, moisture, climate, etc.) within which they must live. A *natural community* is the mix of plants and animals found living together in a healthy ecosystem. *Sustainability* refers to our ability to enjoy and make use of natural communities in a manner that does not compromise future generations' ability to do the same.

Biodiversity is the totality of genes, species, and ecosystems in a region. For example, a healthy prairie community would normally include dozens of plant species as well as habitat for various species of birds, mammals, reptiles, amphibians, insects, mites, fungi, and bacteria. Within a region the size of the Chicago area, biodiversity can also be measured by the number and variety of natural communities that exist side by side in a given area, such as oak savannas, meadows, and wetlands. A high degree of biodiversity is normally an indication of a healthy, sustainable natural community, ecosystem, or region.

This plan identifies 49 different natural community types in the region. Of these, 25 are at least rare or uncommon at the global level, and as many as 23 are globally imperiled. Approximately 1,500 native plant species occur in the region, making the Chicago metropolitan area one of the more botanically rich areas, natural or otherwise, in the United States. This plan also finds that many of the region's animals, including grassland birds, woodland birds, savanna reptiles and amphibians, marsh reptiles and amphibians, prairie insects, and savanna and woodland insects, are globally important for conservation.

Around the world, people depend on biodiversity for the very sustenance of life. The living things with which we share the planet provide us with clean water and air, food, clothing, shelter, medicines, and aesthetic enjoyment, and they also embody our feelings of shared culture, history, and community. The nations of the world have signed a treaty calling biodiversity the common heritage of humankind and calling on all people to be custodians of the biodiversity found in their countries and regions.

In Chicago Wilderness, the value of biodiversity is not just at the global level, but most importantly for our own citizens. Natural communities and species are the basis of the region's environmental health. They provide ecological services in maintaining water quality, abating the impact of floods, supporting pollination of crops, and controlling outbreaks of pests. Equally important, biodiversity contributes immeasurably to the quality of life for the citizens of the region and to the region's long-term economic vitality. Recent polls and election results show that residents of the region strongly support protection of natural areas for the future. Only if we continue and expand upon the far-sighted conservation work of those who built the Chicago region, will we be able to pass these precious biodiversity values on to future generations.

Yet, there is overwhelming evidence that our projected development patterns and their unanticipated results will lead to diminishing economic benefits and degradation of the other services that we derive from our living resources. A further discussion of the benefits of preserving biodiversity and the implications of future growth in the region are contained later in the Recovery Plan.

1.1.3 What is the recovery plan?

The Biodiversity Recovery Plan is both a plan and a process guided by its many sponsors. It is intended as a living document, not a fixed roadmap, that will continue to evolve as new ideas and information arise. For that reason, it is a snapshot in time, presenting our best evaluation of the current situation and how we can address issues and capitalize on opportunities. The success of the plan depends on the responses of those who read it and incorporate its findings and suggestions into their own work. Likewise, its future usefulness depends on suggestions for improvement and new priorities from its readers.

The plan is intended to complement the many other planning efforts that are guiding the region toward a better and more productive future. Foremost among these are the plans of the three regional planning commissions; the Northeastern Illinois Planning Commission (NIPC), the Southeastern Wisconsin Regional Planning Commission (SEWRPC), and the Northwestern Indiana Regional Planning Commission (NIRPC). Other efforts are also contributing to the regional discussions, including the Campaign for Sensible Growth and the Metropolis 2020 Plan.

This recovery plan outlines the steps necessary to achieve the overall goal of the Chicago Wilderness collaboration. That goal, in summary, is *to protect the natural communities of the Chicago region and to restore them to long-term viability, in order to enrich the quality of life of its citizens and to contribute to the preservation of global biodiversity.*

To achieve this goal, the recovery plan identifies the following measurable objectives:

1. ***Involve*** **the citizens, organizations, and agencies of the region in efforts to conserve biodiversity.**
   a. Obtain broad-based and active public participation in the long-term protection, restoration, and stewardship of the region's natural communities.
   b. Strengthen local government support by communicating with and involving officials in planning efforts and conservation programs.
   c. Build partnerships among organizations and agencies in support of biodiversity in the region.
   d. Maintain and strengthen volunteer participation in stewardship and research.
   e. Stimulate active private-sector involvement.
   f. Integrate a broader range of stakeholders, including businesses and constituency organizations into biodiversity conservation efforts.

2. ***Improve*** **the scientific basis of ecological management.**
   a. Increase knowledge of species, communities, and ecological relationships and processes.
   b. Specify results to be achieved in biodiversity and increased sustainability, including reliable indicators, baselines, and targets.
   c. Evaluate the results of restoration and management alternatives based on data in order to address those alternatives' effects on target species and communities.
   d. Clearly identify conservation priorities.
   e. Develop region-wide performance standards and monitoring techniques that can be implemented by land managers.

3. ***Protect*** **globally and regionally important natural communities.**
   a. Identify priority areas and elements for protection based on an assessment of their contribution to conserving biodiversity at global and regional levels.
   b. Protect high-quality natural areas in sufficient acreage to permit restoration and management for sustainability.
   c. Maintain existing quality of publicly owned, high-quality natural areas.
   d. Protect high-quality natural areas in private ownership.
   e. Mitigate factors with negative impacts that occur outside of natural areas but within their watersheds or buffer zones.

4. ***Restore*** **natural communities to ecological health.**
   a. Reestablish the ecological health of deteriorating high-quality natural areas.
   b. Improve all natural areas, concentrating first on those that contribute most to global and regional biodiversity.
   c. Provide corridors that link areas as needed.
   d. Restore ecological processes that support sustainable systems.
   e. Return natural communities to sufficient size for viable animal populations by restoring or recreating them. Fermilab and Midewin are examples.

5. ***Manage*** **natural communities to sustain native biodiversity.**
   a. Attain greater capability for ecological management within public entities.
   b. Encourage sharing of experience and resources among natural-area managers in different jurisdictions.
   c. Monitor recovery progress and status of natural communities.
   d. Demonstrate the feasibility of protection and restoration in fragmented, human-dominated landscapes, making use of such tools as prescribed burning, restoration of hydrology, and removal of invasive species.

6. ***Develop*** **citizen awareness and understanding of local biodiversity to ensure support and participation.**
   a. Form educational partnerships among citizens, organizations, and agencies to promote awareness.
   b. Build sufficient awareness of natural communities of the region and their global significance so that they become a recognized part of the culture of the region.
   c. Develop educational programs to promote broad-based understanding of the global significance of the region's natural communities.

d. Design educational strategies to meet the needs of all audiences at all levels.

e. Reach those not traditionally involved with education in natural history or conservation.

7. *Foster* a sustainable relationship between society and nature in the region.

a. Integrate conservation of biodiversity into ongoing development and planning for land use, transportation, and infrastructure.

b. Encourage major land users to adopt practices that promote biodiversity and its sustainability by integrating the beauty and function of nature into our neighborhood, corporate, and public lands.

c. Encourage inclusion of biodiversity goals in local planning and implementation.

d. Identify and address factors that lead to sustainable use.

e. Regularly monitor indicators of biodiversity and sustainability throughout the region.

f. Support and encourage efforts of citizen scientists working to conserve biodiversity.

8. *Enrich* the quality of the lives of the region's citizens.

a. Enhance human health through improved air and water quality as well as protection from flooding by restoring and maintaining the ecological integrity of natural communities.

b. Increase opportunities for all citizens to experience the beauty and restorative powers of nature.

c. Identify strategies that promote economic growth while sustaining biodiversity.

1.1.4 Who are the plan's intended audiences?

One primary audience for the Recovery Plan includes the thousands of staff members and hundreds of thousands of members of Chicago Wilderness organizations. These organizations have accepted responsibility for helping to define and achieve the results contained in the plan.

Another primary audience is all persons who are responsible for making or shaping decisions that affect the region's land use, water-resource management, and biodiversity. Included here are local, state, and federal elected and appointed officials and private owners of large properties. Also included are key opinion shapers and recognized leaders in the region.

A third audience includes all concerned and active citizens. Those who vote, speak out publicly and privately, and make choices of many kinds are crucial participants in the Chicago Wilderness collaboration. This third audience will be reached primarily through the plan's components of public participation and education, rather than through the plan directly.

1.2 The vision

For the past 200 years, the south end of Lake Michigan has been the setting of a classic drama. While building its economic and cultural wealth, Chicago, one of the nation's largest metropolises, has partially preserved the natural communities that had developed here since the retreat of the last glacier, approximately 10,000 years ago. As the metropolis continues to expand, its natural riches decline. Hence the vision:

To establish a broad policy of beneficial coexistence in which the region's natural heritage is preserved, improved, and expanded even as the metropolis grows.

At the landscape level, the vision includes a network of protected lands and waters that will preserve habitat for a complete spectrum of the region's natural communities. More natural land—both public and private—will have been added to the current core areas and their management will be both active and adaptive. A critical mass of sites will be large enough to maintain a sustainable complex of interdependent species and natural communities. Carefully monitored habitat corridors will connect sites, both small and large, opening paths for ancient patterns of migration and dispersal. Fire will be used as a management tool in order to promote ecosystem renewal. Cycles of prescribed burning will continue the work of lightning and Native American cultures.

At the ecosystem level, water will regain its rightful place as a natural agent of renewal. Rainstorms will drain more slowly, with less damage to downstream properties and to the streams themselves, due to the capacity for temporary storage and absorption afforded by natural open lands. With appropriate management, preserved lands and water bodies will again host healthy communities of native plants and animals for future generations to study and enjoy.

At the species level, regional populations of animals and plants will be assured long-term viability. Size and connectivity of habitat will contribute to their survival; rare species will be protected from catastrophe. Whether native like deer or alien like purple loosestrife, problem

species will be prevented from destroying the natural communities in which they live.

While our busy lives do not always provide enough opportunity to consider our increasingly precarious relationship with nature, we have reached the point where we must fulfill this vision to benefit one species more than all others—our own. The region's human communities will reclaim a cultural tradition of restoring, protecting, and managing the globally outstanding natural communities that enrich our lives. In the spirit of the far-sighted planners who created this region's earliest forest preserves, we will make our built environment compatible with the needs of our wild neighbors.

The foundation for this vision already exists in the region's extensive parks and forest preserves, in the regulations protecting wetlands, flood plains, and rare and endangered species, in the investments already made to improve the quality of water in the region's streams, rivers, and lakes, and in the public and private institutions whose missions include a concern for the region's natural environment. Even so, the fulfillment of the vision will require a greatly expanded level of public understanding and support. Indeed, this vision can only be realized if it becomes broadly shared.

1.3 Key findings and recommendations

The Biodiversity Recovery Plan contains a number of recommended actions at varied levels of detail and importance. Some of the more important ones are indicated below, either verbatim or in summary form, with chapter references.

1.3.1 Preserve more land with existing or potential benefits for biodiversity.

The Chicago region currently contains 200,000 acres of protected land in national parks, state parks, regional forest preserves, and open spaces owned and maintained by park districts, private institutions, and corporations. All of these lands contain important natural communities or else serve as buffers, protecting and supporting the natural areas. Over the past few years, local preservation agencies have steadily acquired land for a variety of purposes and they expect to acquire more in the years ahead. *This plan recommends that a high priority be given to identifying and preserving important but unprotected natural communities, especially those threatened by development, and to protecting areas that can function as large blocks of natural habitat though restoration and management. The plan recommends that these areas be preserved where possible by the expansion of public preserves, by the public acquisition of large new sites, or by the actions of qualified private owners.*

- Public and private agencies should act immediately to preserve those high-quality natural areas in the region that remain unprotected. High-quality remnants, even if small, are important reservoirs of genetic material for maintaining regional biodiversity. Emphasis should be on those community types of higher priority as outlined in this plan. (Chapter 4, 5)
- Chicago Wilderness and the regions' land-owning agencies should develop a priority list of areas needing protection based on regional priorities for biodiversity conservation. (Chapter 5)
- Federal, state, and local funding for land acquisition by county forest preserve and conservation districts and by other preservation agencies should be expanded with the preservation of biodiversity as a priority. Recognizing that public funds are limited, biodiversity conservation efforts should to the greatest extent possible also support the multiple-use missions of public agencies. (Chapters 8, 11)
- In Illinois, the state's imposition of property-tax caps makes the funding of further acquisition and management more problematic. Local governments should seek to pass referenda as necessary to obtain the revenues needed to achieve this plan. (Chapters 8, 11)
- State governments should increase funding to open-space grants programs, both for their own lands and for lands to be acquired by county forest preserve and conservation districts. (Chapter 11)
- Increased federal funding for preserving conservation land is a critical need. High priority should be given to applications by states and local governments that address critical needs for conserving biodiversity as outlined in this plan. (Chapter 11)
- Land-acquisition plans of public agencies should give consideration to the presence of endangered and threatened species. (Chapter 7)
- The granting of protective easements and other protective measures by private landowners for natural areas and buffer zones is an important tool for biodiversity protection and will increase in significance as acquisition of public lands becomes more difficult. More training and resources for the use of these techniques are needed. (Chapter 8)

1.3.2 Manage more land to protect and restore biodiversity.

Much of the region's legally protected land is not yet being effectively managed to preserve remnant native communities. Until recently, it was thought that most types of natural areas, if left alone, would preserve themselves. Studies have increasingly shown that the quality of our natural communities, including those protected by public ownership, is steadily degrading because natural processes have been interrupted and / or because of invasive or overly abundant species. (See Chapter 5.) The continuing degradation of existing preserves is a major threat to sustaining and enhancing biodiversity.

Ecological management practices are available to deal with these problems. Limited management is underway in certain forest preserves and parks and on some privately held lands. But current levels of management are, in most instances, far from adequate. *Therefore, this plan assigns the highest priority to establishing and maintaining the proper management of natural communities.*

- More resources need to be applied to the management of protected lands in the region. The shortage of dollars to manage lands and waters for biodiversity represents a major threat to the region's natural communities. In addition to the high-quality sites being managed today, medium- and lower-quality sites, particularly those containing higher-priority community types, need management efforts. (Chapter 5)
- State-of-the-art management practices should be applied more broadly to protected lands. This will require more qualified personnel, both volunteer and paid, than are presently available (Chapters 5, 9, 11). Land managers should apply a diversity of management practices in order to sustain natural communities. (Chapter 5)
- The expanded and more effective use of volunteers in land management, monitoring, and stewardship will be essential for maintaining the health of conservation lands. (Chapter 11)
- The use of prescribed fire needs to be greatly expanded. A regional training program should be developed for crew members and burn leaders. Outreach programs should be used to educate local governments in the use of prescribed fire in managing natural ecosystems. State agencies need to craft air-quality regulations that foster the expanded use of prescribed burns. Finally, a variety of burn strategies is needed. A single management regime, such as burning at the same intensity and same time each year, is unlikely to sustain biological diversity. (Chapters 5, 9)
- Planning for the management of natural communities should be carried out on a countywide or regional scale, allowing a diversity of management strategies and effects. For example, wetland management should be coordinated on a regional basis to assure that birds have appropriate habitat within the region regardless of local fluctuations in wetland conditions. (Chapters 5, 9)

1.3.3 Protect high-quality streams and lakes through watershed planning and mitigation of harmful activities to conserve aquatic biodiversity.

One of the most significant negative impacts of human settlement on the Chicago region's natural environment has been on streams, rivers, lakes, and wetlands. Draining and filling of wetlands, channelizing of streams, increases in storm-water runoff due to expanding impervious surfaces and resultant changes in the frequency and extent of floods, changes in groundwater levels, and the introduction of wastes, chemical products, and eroded soils into all of the region's water bodies have had disastrous consequences for virtually all forms of aquatic life.

As urbanization continues, programs, policies, and regulations to manage water resources should be developed and implemented with an eye to sustaining natural communities. The effectiveness of our efforts to manage water resources should be measured, in part, by the number and variety of native species found in aquatic habitats throughout the region.

- The highest priority for biodiversity conservation is to maintain the quality of the remaining high-quality streams and lakes, those that support high numbers of native and threatened species. (Chapter 6)
- State and local public agencies should protect high-quality streams and lakes through proper watershed planning and management, including plans for storm-water management. (Chapters 6, 8)
- Local agencies should promote natural drainage, create buffer strips and greenways along streams, and create or restore streamside wetlands. Attention should be given to changes in groundwater levels for terrestrial communities and wetlands. (Chapters 5, 6, 8)
- Local agencies and private landowners should consider restoring streams to their natural meandering courses, restoring riffles and other elements of stream habitat, and using bioengineering solutions to control streambank erosion. (Chapter 6, 8)

- Local agencies should avoid new or expanded wastewater discharges into high-quality streams. Alternatives include routing flows to regional facilities, using land treatment, and using constructed wetlands for improving treated effluent before discharging to streams. (Chapters 6, 8)
- Many dams in the region impede the movement of fish and other aquatic life up and down the waterway. Consequently, high-quality streams sometimes abruptly deteriorate above or below a dam. Where dams are not needed for water supply, flood control, or recreation, removal or modification with structures that effectively permit the passage of aquatic species would help to conserve biodiversity (Chapter 6).

1.3.4 Continue and expand research and monitoring.

While land managers use the best current knowledge about the management needs of natural communities and species, there is always opportunity and need to improve management techniques and learn more about the complexity of ecosystems and their functioning. Management and monitoring activities need to be organized so that they help evaluate the effectiveness of current techniques, and research projects need to be designed to answer questions relevant to management. There are distinct differences between research, monitoring, and inventory, yet if these activities are linked together in meaningful ways, the results can immediately be put to use by conservation practitioners and thus can improve biodiversity management. Management within an experimental framework, making use of results in future management decisions, is referred to as adaptive management. *Developing and implementing a regional monitoring program and pursuing a prioritized research agenda will provide significant contributions to conservation of biodiversity.*

- Compile a prioritized list of research needs. Support research projects that will help Chicago Wilderness scientists and land managers to better understand presettlement landscape conditions and processes, current landscape conditions and processes, the best techniques to restore communities to improved ecological health, and requirements for sustaining biodiversity over the long-term. Examples of specific areas of research needs are given in Chapter 5.
- Compile a thorough literature review of previous studies regarding management of natural communities and conservation of biodiversity relevant to efforts in Chicago Wilderness. (Chapter 9)
- Develop better links with academia and promote more research projects within the Chicago Wilderness region. This could be achieved through a number of approaches, including setting up a central location of priority research needs as a resource for graduate students. Another suggestion is to promote the Chicago Wilderness region as a research station. This would help students to identify appropriate sites and experts, as well as to receive permits. (Chapter 9)
- Develop and implement a regional monitoring protocol that emphasizes adaptive management for making progress toward selected management goals. (Chapter 9)

1.3.5 Apply both public and private resources more extensively and effectively to inform the region's citizens of their natural heritage and what must be done to protect it.

A precondition to the success of any important public endeavor is the understanding and support of a significant portion of the public. The topic of sustaining biodiversity, including an understanding of its importance to current and future generations, is just beginning to be taught in schools and conveyed through the local media. Many communities are not being reached through these efforts and even citizens who already have a strong environmental ethic are often unaware of the richness of our regional biodiversity and of local restoration successes.

Chapter 10 lays out two types of communications actions aimed at addressing the challenge described above. The long-term goals are necessary to build long-term capacity and understanding in the region, while the short-term goals address immediate issues of communication and public relations.

- Ensure that every student graduating from a school in the Chicago Wilderness region is "biodiversity-literate."
- Make topics relating to biodiversity and Chicago Wilderness a focus of local colleges and universities.
- Increase the number of communities receiving non-school-based biodiversity education programs.
- Gain a better understanding of the views of a broader segment of the Chicago-area population on restoration.
- Improve the public's understanding of the role of management in natural areas and communicate documented benefits of local restoration efforts, particularly those of most value to humans.

- Foster local grassroots communication and provide more opportunities for citizens to get involved in the decision-making process. Work with user groups affected by restoration efforts on issues of common concern.
- Improve the credibility and public perception of the people involved in restoration efforts.
- Engage advocacy organizations in our efforts. Put a structure in place to respond quickly to issues of perception as they arise.
- Assess the current state of biodiversity knowledge held by key decision-makers such as elected officials and their staff, land managers, and planners. Create programs to address their needs for biodiversity education.

1.3.6 Adopt local and regional development policies that reflect the need to restore and maintain biodiversity.

In the course of regulating private development and expanding the public infrastructure in the three-state region, public officials have the opportunity to preserve and enhance biodiversity. This can be accomplished through the inclusion of biodiversity objectives within state, regional, and local plans and laws or ordinances governing the urban and suburban development processes.

- Counties and municipalities should amend their comprehensive plans, zoning ordinances, and other regulations to incorporate relevant recommendations contained in this plan. (Chapter 8, 11)
- The Illinois EPA should establish a process for reviewing and approving the expansion of wastewater service areas that takes into consideration the impacts on the total natural environment within affected watersheds. (Chapters 6, 8)
- State agencies responsible for major transportation infrastructure should incorporate biodiversity principles into their planning and implementation decisions. Further, when a state infrastructure investment such as a toll road or major airport is likely to trigger substantial residential, commercial, or industrial development, impacted state agencies and local governments should be required to enter enforceable agreements minimizing adverse environmental impacts including the loss of biodiversity. (Chapter 11)
- Support the Regional Greenways Plan for northeastern Illinois and the Natural Areas Plan for southwestern Wisconsin. These plans identify actions to protect and manage critical habitats for plants and animals and generally improve ecosystems. They complement and support the objectives of this Recovery Plan. (Chapters 3, 8)
- Participate in the discussions of the Campaign for Sensible Growth and Metropolis 2020. The Campaign promotes principles of economic development, redevelopment, and open space preservation. Metropolis 2020 has proposed actions to help the region develop in a manner that will protect its economic vitality, while maintaining its high quality of life. (Chapter 3)
- Support implementation of regional growth strategies by the Northeastern Illinois Planning Commission, the Southeastern Wisconsin Regional Planning Commission, and the Northwest Indiana Regional Planning Commission, insofar as these plans seek to reduce the region's excessive rate of land consumption, preserve important open spaces, and promote improved water quality. (Chapter 3)